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The physiological impact of wearing an N95 mask during hemodialysis as a precaution against SARS in patients with end-stage renal disease

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Abstract

Background and purpose: Most patients with end-stage renal disease (ESRD) visiting our hospital for hemodialysis treatment during the SARS outbreak wore an N95 mask. Data on the physiological stress imposed by the wearing of N95 masks remains limited. This study investigated the physiological impact of wearing an N95 mask during hemodialysis (HD) on patients with ESRD.

Methods: ESRD patients who received regular HD at National Taiwan University Hospital between April to June 2003 were enrolled. Each patient wore a new N95 mask (3M Model 8210) during HD (4 hours). Vital signs, clinical symptoms and arterial blood gas measured before and at the end of HD were compared.

Results: Thirty nine patients (23 men; mean age, 57.2 years) were recruited for participation in the study. Seventy percent of the patients showed a reduction in partial pressure of oxygen (PaO₂), and 19% developed various degrees of hypoxemia. Wearing an N95 mask significantly reduced the PaO₂ level (101.7 +/- 12.6 to 92.7 +/- 15.8 mm Hg, p = 0.006), increased the respiratory rate (16.8 +/- 2.8 to 18.8 +/- 2.7/min, p < 0.001), and increased the occurrence of chest discomfort (3 to 11 patients, p = 0.014) and respiratory distress (1 to 17 patients, p < 0.001). Baseline PaO₂ level was the only significant predictor of the magnitude of PaO₂ reduction (p < 0.001).

Conclusion: Wearing an N95 mask for 4 hours during HD significantly reduced PaO₂ and increased respiratory adverse effects in ESRD patients.

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